



Review Article

A CRITICAL AYURVEDIC LITERARY REVIEW OF THE PLANT *PANASA (ARTOCARPUS HETEROPHYLLUS LAM.)*

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ABSTRACT

Panasa (Artocarpus heterophyllus Lam), the well known jackfruit tree is widely distributed all over the world. It is a treasure trove of various ethnomedical uses which are yet to be proven scientifically. Its fruit is very delicious and its leaves, root, latex, seed and wood are reported to have many medicinal properties. Though the plant is renowned for its nutritive values, the useful parts of the plant with rich medicinal values are less utilized for medicinal purposes. The plant is well described in Ayurvedic classics where prime importance has been given to its fruit whereas least references are available concerned to its other useful parts especially the leaf. This forms the literature gap concerned with this drug that hinders its further clinical researches. A compiled review of the classical literature of *Panasa* is not yet available as a ready reference. Hence it is a herculean task for the researcher to compile the literature which is scattered in various classical books of different era. In this work focus has been made to compile the literature of the plant *Panasa (Artocarpus heterophyllus Lam)* from the Ayurvedic classics. As this work provides the literature of this plant under a single roof it will be helpful for the scholars in future research works.

KEYWORDS: *Panasa*, *Artocarpus heterophyllus*, *Samhitas*, *Nighantus*.

INTRODUCTION

Health care system since time immemorial trusts upon medicinal plants as the essential elements of treatment. Ayurveda is one such traditional system of medicine which describes the miraculous effects of medicinal plants when handled timely and judiciously. Demand for herbal drugs is increasing day by day and Ayurvedic drugs are gaining popularity as they have comparatively lesser side effects and less known cumulative toxicity. It is the need of the hour to find out and propagate the medicinal uses of inexpensive, safe and abundant plant sources for the welfare of mankind. *Panasa (Artocarpus heterophyllus Lam)* is one such plant which is widely distributed all over the world. The hot water extract of its leaves is used by the traditional Ayurvedic medical practitioners of India for the effective management of Type 2 diabetes mellitus. It is the folklore medicine for diabetes in Mauritius^[1]. The plant is reported to have wide ethnomedical uses. The plant shows hypoglycaemic^[2-6], antipyretic, analgesic, immune modulatory^[7], antioxidant^[4], anti inflammatory^[8], and anti tumour activities which are scientifically proven. Also it is bestowed with the capacity to cure diarrhea, asthma, convulsions, wound, inflammations etc. In ethnomedicine it is used as nervine sedative, abortifacient, aphrodisiac, antiemetic etc. Most of these uses are not scientifically proven. In Ayurvedic literature the plant is mentioned to possess *Raktapittahara*, *Sukravardhana*, *Sophahara*, *Twakdoshahara* properties which are yet to be explored.

The drug of interest is not mentioned in Ayurvedic pharmacopoeia of India and its classical literature is not available in a compiled form. As the knowledge regarding the plants is scattered in various classical text books of various era it becomes a herculean task for the scholars to gather the information. In this paper effort has been made to compile the classical literature of *Panasa (Artocarpus heterophyllus Lam)* under a single roof for ready reference.

Objective

To provide comprehensive literary knowledge of *Panasa (Artocarpus heterophyllus Lam)* as per Ayurvedic classics.

Methodology

Various text books that comprised of pharmacopoeias, *Nighantu*, *Samhita* and recent text books of *Dravyagunavijnan* concerned with the drug of interest was systematically reviewed and critically analysed to satisfy the objective.

Etymology of the Word *Panasa*

The word meaning of *Panasa* is 'that which is admirable by human beings and God'^[9].

History

Information regarding the plant is not available in Vedic literature. *Panasa* is described under *Phala varga* in *Brihatrayi* text books which indicates the importance of its fruit. Jackfruit is quoted as nutritious and tonic by *Nighantu* writers. The properties of leaves are not

available in any of the *Nighantus* or *Brihatrayi* text books. Later on text books of *Dravyagunavijnana* mentioned the properties of its leaves.

Classical Categorization

Based on pharmacological properties, uses etc, various textbooks classified drugs into different groups like *Ganas*, *Vargas* or *Kulas*.

Classification of *Panasa* is as mentioned below.

Table 1: Classification of Panasa in various Ayurvedic texts

| Name of Varga | RN ^[10] | KN ^[11] | B.P ^[12] | MPN ^[13] | AK ^[14] | SS ^[15] | CS ^[16] | AH ^[17] | VA ^[18] |
|---------------------------|--------------------|--------------------|---------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| <i>Amradi</i> | + | - | - | - | - | - | - | - | - |
| <i>Oushadhi varga</i> | - | + | - | - | - | - | - | - | - |
| <i>Amradi phala varga</i> | - | - | + | - | - | - | - | - | - |
| <i>Phaladi varga</i> | - | - | - | + | - | - | - | - | - |
| <i>Vanoushadhi vargam</i> | - | - | - | - | + | - | - | - | - |
| <i>Phala vargam</i> | - | - | - | - | - | + | + | + | - |
| <i>Misra phalgu gana</i> | - | - | - | - | - | - | - | - | + |

Synonyms and their probable

Interpretations

Synonyms indicate specific characters of plants which help their proper identification based on habitat, form, colour, potency, taste, effect etc. Synonyms of *Panasa* and their probable interpretations are tabulated below.

Synonyms

Panasa
Agraja
Mahaphala
Mocha
Phalina
Sthulakantaphala
Moolaphalada
Apushpaphalada
Sleshmataka sadrikpatra
Kantakiphala
Ativrihatphala, Sthulaphala & Brihatphala
Kaantaphala
Ksheeradru

Interpretation

: That which is admirable by human beings and God^[9]
 : That which originated in the beginning^[19]
 : The tree having large fruit
 : That which produces sticky material^[20]
 : The tree with fruits
 : Large fruit with thorns
 : Fruits occurring at the base
 : The tree which has fruits without flowers
 : Leaves similar to that of *Sleshmataka* tree
 : Fruits having thorns over the surface
 : The tree with large fruit
 : Fruits having thorns over the surface
 : The tree which produces latex

Table 2: synonyms mentioned in various textbooks

| Synonyms | RN ^[10] | KN ^[11] | B.P ^[12] | IMP ^[21] | SK ^[9] | MPN ^[13] | VA ^[18] |
|------------------------------|--------------------|--------------------|---------------------|---------------------|-------------------|---------------------|--------------------|
| <i>Panasa</i> | + | + | + | + | + | + | - |
| <i>Swarnasara</i> | - | - | - | - | - | - | - |
| <i>Morata</i> | - | - | - | - | - | - | - |
| <i>Agraja</i> | - | - | - | - | - | - | - |
| <i>Ahala</i> | - | - | - | - | - | - | - |
| <i>Mahaphala</i> | - | - | - | - | - | - | - |
| <i>Havirgandhi</i> | - | - | - | - | - | - | - |
| <i>Mocha</i> | - | - | - | - | - | - | - |
| <i>Mahasarja</i> | + | - | - | - | + | - | - |
| <i>Phalina</i> | + | - | - | - | + | - | - |
| <i>Phalavrikshaka</i> | + | - | - | - | + | - | - |
| <i>Sthulakantaphala</i> | + | - | - | - | - | - | - |
| <i>Moolaphalada</i> | + | - | - | - | + | - | - |
| <i>Apushpaphalada</i> | + | - | - | - | + | - | - |
| <i>Pootaphalada</i> | + | - | - | - | - | - | - |
| <i>Sleshmatakasadrkpatra</i> | - | + | - | - | - | - | - |
| <i>Kantakiphala</i> | - | + | + | + | + | + | - |
| <i>Asaya</i> | - | + | - | - | - | - | - |
| <i>Garbhakantaka</i> | - | + | - | - | - | + | - |
| <i>Ativrihatphala</i> | - | - | + | - | - | - | - |
| <i>Sthulaphala</i> | - | - | - | + | - | - | - |
| <i>Brihatphala</i> | - | - | - | + | - | - | - |
| <i>Mridangaphalaka</i> | - | - | - | + | + | - | - |
| <i>Sthula</i> | - | - | - | + | + | - | - |
| <i>Kaantaphala</i> | - | - | - | + | - | - | - |
| <i>Phalavaarshika</i> | - | - | - | - | - | - | - |

| | | | | | | | |
|---------------|---|---|---|---|---|---|---|
| Amasayaphalam | - | - | - | - | - | - | - |
| Palasa | - | - | - | - | - | - | - |
| Karataphala | - | - | - | - | + | - | - |
| Champakosha | - | - | - | - | + | - | - |
| Champalu | - | - | - | - | + | - | - |
| Karatakiphala | - | - | - | - | + | - | - |
| Rasala | - | - | - | - | + | - | - |
| Ksheeradruh | - | - | - | - | - | - | + |
| Sunga vriksha | - | - | - | - | - | - | + |

PHARMACOLOGICAL PROPERTIES

In Ayurveda, pharmacological properties of a drug are mentioned by its *Rasa*, *Guna*, *Veerya* and *Vipaka*.

Table: 3 Specific pharmacological properties of the plant mentioned in various text books

| Reference | Plant part | Guna & Karma |
|--|----------------------------|---|
| Bhavaprakasa nighantu ^[12] | <i>Pakvaphala</i> | <i>Seetha, Snigdha, Vatapittahara, Tarpana, Brimhana, Mamsala, Sleshmala, Balya, Sukraprada, Raktapittakshathavranahara</i> |
| | <i>Amaphalam</i> | <i>Vishtambhi, Vatala, Tuvara, Guru, Dahakrit, Madhura, Balya, Kaphamedovivardhana</i> |
| | <i>Beejam</i> | <i>Guru, Vrishya, Madhura, Baddhamoothrakara, Srishtavidka</i> |
| | <i>Majja</i> | <i>Vrishya, Vatapittakaphapaha,</i> |
| Kaiyyadeva Nighantu ^[11] | <i>Panasa</i> | <i>Tuvara, Swadu, Guru, Vishtambhi, Vatala.</i> |
| | <i>Pushpa</i> | <i>Tikta, Guru, Vaktravisodhana</i> |
| | <i>Bala phala</i> | <i>Kaphamedovivardhana, Vatapittahara, Balya, Dahakhna, Madhura, Guru</i> |
| | <i>Pakvaphala</i> | <i>Raktapittahara, Madhuravipaka, Seeta, Tarpana, Brimhana, Vrishyam, Mamsala, Sleshmala</i> |
| | <i>Beeja</i> | <i>Balya, Snigdha, Vathahara, Kshataraktakshayahara, Vrishya, Madhura</i> |
| | <i>Majja</i> | <i>Guru, Baddhavidka, Srishtamoothrakara, Pittakhna, Vrishya, Slehmaanilapaha</i> |
| Indian Medicinal Plants ^[21] | <i>Beeja</i> | <i>Ruchya, Madhura, Vrishya, Balaprada, Hridya</i> |
| | <i>Panasapathra vrinda</i> | <i>Kinchiththikta, Jwarapaha, Vathahara</i> |
| | <i>Pathra</i> | <i>Kinchiththikta, Jwarapaha, Vathahara.</i> |
| Rajanighantu ^[10] | <i>Panasa</i> | <i>Madhura, Picchila, Guru, Hridya, Balaveeryavridhikara, Sramadahavisoshanasana, Ruchikrit, Grahi, Durjara</i> |
| | <i>Beeja</i> | <i>Eeshatkashaya, Madhura, Vatala, Guru</i> |
| | <i>Phala</i> | <i>Ruchya, Twakdoshanasana,</i> |
| | <i>Balaphala</i> | <i>Neerasa, Hridya</i> |
| | <i>Madhyapakva phala</i> | <i>Deepana</i> |
| | <i>Pakvaphala</i> | <i>Deepana</i> |
| Dravyaguna Vijnanam ^[22-24] | <i>Phala</i> | <i>Vishtambhi, Durjara, Ruchya, Tarpana</i> |
| | <i>Twak</i> | <i>Sthambhana</i> |
| | <i>Fruit</i> | <i>Sukravardhana, Raktasthambhana</i> |
| | <i>Ripe fruit</i> | <i>Twakdoshahara, Balya</i> |
| | <i>Pathra</i> | <i>Vishakhna, Madhura, Kashaya, Guru, Snigdha, Seeta, Madhuravipaka</i> |
| | <i>Ksheera</i> | <i>Sophahara, Vranapachana</i> |
| | <i>Beeja</i> | <i>Vrishya</i> |
| | <i>Pushpa</i> | <i>Vaktravisodhana</i> |
| | <i>Balaphala</i> | <i>Neerasam</i> |
| | <i>Madhyapakva phalam</i> | <i>Hridya</i> |
| | <i>Pakvaphala</i> | <i>Deepana</i> |

Important Formulations

- *Amakereerkiladi Kashayam* for *Vishoochika*^[25]
- *Panasacchada Kwadha* is used as *Anupana* for *Dhanwantara gulika*.^[25]

Parts used: Roots, leaves, fruits, seeds, latex, wood and bark.

Dose: Decoction 50-100 ml^[23]

Therapeutic Uses**i. Roots**

- Roots are credited with anti-diarrheal property.^[21]
- Root decoction is useful in skin diseases.^[22]
- Application of *Panasa* root paste will be helpful in *Apachi*.^[23]

- Root is useful in asthma [23]

ii. Leaves

- Useful in fever, boils, wounds, skin diseases and vitiated conditions of *Vata* and *Pitta*. [21]
- Leaf decoction is useful in poisoning. [22] The young leaves as fomentation are applied to boils and wounds to dry them. Leaves are considered as an antidote to snake poison. They enter in a compound Munda medicine drunk to stop vomiting. [27] Leaves are not an antidote to either snake venom or scorpion venom. [27] Leaves are used as an ingredient for the preparation of decoction for postpartum baths.

iii. Unripe fruits

Acrid, astringent, carminative and tonic. They are useful in vitiated conditions of *Vata*, *Pitta* and ulcers.¹⁸ laxative difficult to digest although very nutritious. [27]

iv. Ripe fruit

The ripe fruit is cooling, oleaginous, tonic, fattening, aphrodisiac, useful in biliousness, *Vata*, leprosy, ulcers; causes *Kapha*. [27]

v. Seeds

The seeds are sweet, diuretic, aphrodisiac and causes constipation. [21]

vi. Wood

In Cambodia, the wood is considered as a nerve sedative and is useful in convulsions. The pith is taken internally as an abortifacient. [27]

vii. Latex

The latex is useful in dysopia, ophthalmitis and pharyngitis. [21]

viii. Bark

Decoction of bark is useful in diarrhea. [27]

ix. Juice

The juice of the plant is used externally to glandular swellings and abscesses to promote suppuration. [27]

x. Tubers

The tubers if worn on the waist, are said to cure hydrocele. [27]

Various plant parts are used in toothache, caries, stomach complaints, sores, smallpox, carbuncle, sterility in women and post natal complaints. [26]

Research Updates

- Aqueous leaf extract of *Artocarpus heterophyllus* Lam has significant alpha-amylase inhibitory activity in rat plasma. [1]
- Chronic administration of the Ethyl acetate fraction of mature *A. heterophyllus* leaves daily for 5 weeks resulted in a significant lowering of serum glucose, cholesterol and triglyceride (TG) levels in streptozotocin induced diabetic rats. [3]
- Ethanol extract and n- butanol extract of *Artocarpus heterophyllus* leaves showed antioxidant, hypoglycemic and hypolipidemic effect on streptozotocin induced diabetic rats. [4]
- The methanolic and aqueous extracts of leaves of *A. heterophyllus* were administered to the experimental animals among which the methanolic extract of *A.*

heterophyllus leaves have shown to be exhibit significant analgesic and immunomodulator effect by paw licking and increasing the swimming or survival time (P<0.001) respectively in mice. [7]

CONCLUSION

From the literary review it is found that the plant *Panasa* is well described in Ayurvedic classical text books. But in all the references prime importance is given to its fruit especially in the form of food. References regarding the properties of the other plant parts like *Beeja*, *Majja*, *Pushpa*, *Vrinda*, *Twak* etc are also available. But no references of use of its leaves are available in the classical text books. Later text books of *Dravyagunavijnana* gives some idea regarding the properties of leaves. Even though some medicinal uses are mentioned in classics it is not utilized for medicinal purposes. The drug is also not included in Ayurveda Pharmacopoea of India. The properties of plant parts of *Panasa* are yet to be explored. In the present scenario life style disorders like infertility, diabetes etc are increasing. Due to excessive pollution, allergic diseases like asthma are also reaching the peaks. The properties attributed to this plant like *Vrishya* and *Sukraprada* property of fruit if explored will serve as a drug for infertility. Decoction of the leaves can be popularised as a medicine for diabetes as research works have proven its hypoglycaemic effect. Utility of roots and leaves of this plant in asthma may also be explored in this context. In this era where herbal drug industry is facing raw drug scarcity, underutilized plants like *Panasa* should be explored and its medicinal properties should be promoted. As *Panasa* is a large tree it possesses large quantity of leaves which are unknowingly wasted in the fields. Also research works shows hypolipemic, antioxidant and analgesic activity of its leaves. Moreover classical references shows that its leaves can be used in the form of galactagogue, and antipyretic. If more research works are conducted and its effects like galactagogue activity, antipyretic activity and action as antidote to venom are scientifically proven it will be helpful to the mankind. In this paper effort has been made to compile the classical literature of *Panasa* under a single roof so that it will help the research scholars for ready reference for future research works.

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